AP PSYCH
MR. AIELLO

1999

Section II

PSYCHOLOGY

SECTION II

Time—50 minutes

Percent of total grade—$33\frac{1}{3}$

Directions: You have 50 minutes to answer BOTH of the following questions. It is not enough to answer a question by merely listing facts. You should present a cogent argument based on your critical analysis of the question posed.

1. A. Describe the role of each of the following mechanisms in determining an individual's eating habits and body weight.

Biological Mechanisms	Learning Mechanisms
Body or brain chemistry	Reinforcement
Brain structure	Modeling
Genetics	Cultural factors

B. Select *one* biological and *one* learning mechanism and discuss the implications of each for weight management

Question 1 Scoring Guidelines

Answers to both Part A and B **must be cogent arguments.** The essay should explain by definition and/or example rather than merely mention mechanisms and their effects on eating habits and body weight.

Part A

Point 1: Body/brain chemistry

Name a specific body/brain chemical (e.g., hormone, neurotransmitter) and identify its directional effect on an eating-related behavior, hunger, or body weight.

Exception:

Saying that substances released from the pituitary (or an appropriate endocrine gland, e.g., thyroid) affect eating-related behaviors or body weight is *acceptable without identifying the specific hormone.*

Examples:

If no direction is specified for a substance, assume its presence.

Blood glucose Cholecystokinin (CCK) Norepinephrine Dopamine Serotonin Glucagon Leptin	When levels of these substances are low, hunger or eating results When levels of these substances are high, satiety (fullness) results

Insulin Neuropeptide Y	When levels of these substances are high, hunger or eating results When levels of these substances are low, satiety (fullness) results

Too vague to score:

- "Low blood sugar" (no explanation).
- "Blood sugar relates to hunger" (doesn't specify direction of effect).
- "Marijuana causes munchies" (exogenous drugs don't score).

Other considerations:

- Trap: Metabolism is a process, not a chemical. Do not score.
- Accept abbreviations (e.g., CCK). Allow for reasonable permutations.
- Ignore (do not penalize) misstatements about a specific chemical agent in an otherwise correct answer (e.g., glucose as a neurotransmitter or CCK from stomach).
- Exogenous drugs don't score, but watch for the naming of a specific endogenous mechanism (e.g., "Prozac decreases hunger by increasing serotonin" scores because of the correct reference to serotonin, but "Prozac decreases hunger" is not sufficient).

Point 2: Brain structure

A. *Name the lateral hypothalamus, ventromedial hypothalamus, or other specific brain structure and explain its role in the regulation of eating or body weight.*

OR

B. *Identify the hypothalamus as regulating eating/body weight* ***in both directions*** *(concept of dual function of hunger and satiety).*

Examples:

A. Specific brain structure
   - Lateral hypothalamus (LH) as eating center (e.g., "stimulation produces eating" or "damage leads to no eating").
   - Ventromedial hypothalamus (VMH) as satiety center (e.g., "stimulation results in satiety" or "lesion produces overeating").
   - Reference to the pituitary controlling metabolism.

B. Dual function of hypothalamus
   - "The hypothalamus regulates both eating and satiety."
   - "Damage to the hypothalamus can either increase eating or produce a feeling of fullness."

Too vague to score:

- "Brain damage causes obesity" (no mechanism specified).
- "Stimulation of the hypothalamus increases hunger" (only one function acknowledged).
- "The hypothalamus regulates eating" (dual role not acknowledged).

Other considerations:

- Trap: Metabolism is a process, not a brain structure. Don't score.
- Score sensory deficits only if appropriate brain structure or neural pathway is specified (e.g., "if the olfactory bulb is damaged, a person will eat less because food is less appealing").
- Accept abbreviations (e.g., LH, VMH) and allow for reasonable permutations.

Point 3: Genetics

Identify one of the following as being genetically-determined:

1. *Body weight set point*
2. *Metabolic rate (BMR)*
3. *Number of fat cells*
4. *Obese (OB) gene (accept chromosome 15)*
5. *Other scientifically-established, genetically-based disorders that have a direct effect on eating habits or body weight (e.g., diabetes, hyperthyroidism, hypothyroidism)*

Too vague to score:

- Inherited tendency or predisposition without reference to one of the acceptable effects, e.g., "a person is genetically programmed to be obese."

Other considerations:

- Trap: Size of fat cells (not number). Don't score.
- Trap: Can't inherit behaviors (Lamarckian). Don't score.

Point 4: Reinforcement

Identify a behavior related to eating or body-weight regulation and explain how it is acquired or maintained by reinforcement (or diminished by punishment). The mechanism of reinforcement can be defined conceptually or established by example.

Reinforcement mechanism:

Terms like "positive reinforcement" and "reward" are sufficient definitions, but "reinforcement" alone is not because it adds nothing to the language of the question. In this latter case, specification of the reinforcer and its relationship to the behavior is necessary.

Allowable relationships:

- Eating (or not eating) behaviors can be reinforced (or punished). Examples: "Eating habits are positively reinforced by parents;" "Poor eating habits are punished by scolding;" "Eating tasty foods is reinforcing, which encourages consumption of those foods."
- Taste aversions can develop, modifying eating habits. For example: "Chemotherapy patients may learn to avoid foods eaten during therapy."
- Food can be used consistently as a reinforcer, thereby changing the recipient's body weight. For example: "A child is given candy for doing daily chores and gains weight."
- Delay of reinforcement affects degree of learning associated with eating. For example: "Eating fruit instead of candy does not immediately improve health so it may be difficult to change eating habits."

Too vague to score:

- "Eating reduces stress" (no reinforcement mechanism identified).
- Child's eating habits reinforced by parents (mechanism of reinforcement not established).

Point 5: Modeling

Acquisition of a behavior related to eating or body weight regulation through observational learning/role modeling

Examples:

- "A child sees her father eating cheeseburgers and adopts this eating habit."
- "A person hears that his favorite athlete eats a special food and begins eating this item."
- "A person reads that a model eats only salads and does the same."

Too vague to score:

- "Your parents eat too much and you do too" (no modeling mechanism identified).
- "I want to be a model" (no eating-related behavior specified).
- "A child models the eating habits of her mother" (repeats the word "model" from the question without adding additional explanation).

Other considerations:

- Mechanism must be explicit — person must observe/see/hear about/be exposed to another's behavior.
- Can be a good or bad outcome on eating-related behavior or behaviors associated with body weight regulation.
- No credit for simply parroting the word "model" unless an appropriate example or explanation is given.

Point 6: Cultural factors

Indicate how cultural pressures, expectations, or norms influence eating-related behavior or standards for body weight. The concept of cultural ***pressure*** *on an individual must be explicit.*

Examples:

- "A thin body ideal in America encourages people to diet."
- "Cultural variations in diet dictate what is eaten."

Too vague to score:

- "In the United States, people are thin" (no pressure).
- "The media pressures people to look like models" (no reference to body weight).
- "Anorexia is caused by the media."

Other considerations:

- Cultural standard must make explicit reference to eating habit or body weight (e.g., thin, not just beauty).
- Trap: Fitness is *not* synonymous with eating habits or body weight regulation.
- Treat societal factors as cultural.

Part B

An essay must give a ***cogent*** *argument showing how the selected mechanism has the potential to manage weight. Management requires an attempt at behavioral regulation; it is not established by merely stating that certain biological or learning factors are difficult or impossible to overcome.*

The essay must identify a selected mechanism (biological or learning).

Special consideration:

- Students often combine biological and learning mechanisms in one paragraph. Points can be awarded for both as long as each mechanism is identified as biological or learning and a strategy for management of each is clear.

Point 7: Biological implications

Examples:

- Strategies designed to correct a physiological dysfunction are identified (e.g., a diabetic using insulin).
- "Monitoring one's diet to counter a genetic predisposition to obesity."

Too vague to score:

- "Inheriting a slow metabolism will make it hard to lose weight" (no action/strategy of weight management).

Point 8: Learning implications

Examples:

- "Learning to eat a balanced diet as a child makes it easier to maintain proper weight."
- "Anorexics actively seek/defend unhealthy body weight."
- "Children in Spain walk a lot and eat a large meal only at lunch, so they are seldom fat."

Too vague to score:

- "A young woman succumbing to cultural pressure to look thin, becomes anorexic" (no mention of weight management).

Sample Student Responses for Question 1

Student Response 1 — Excellent

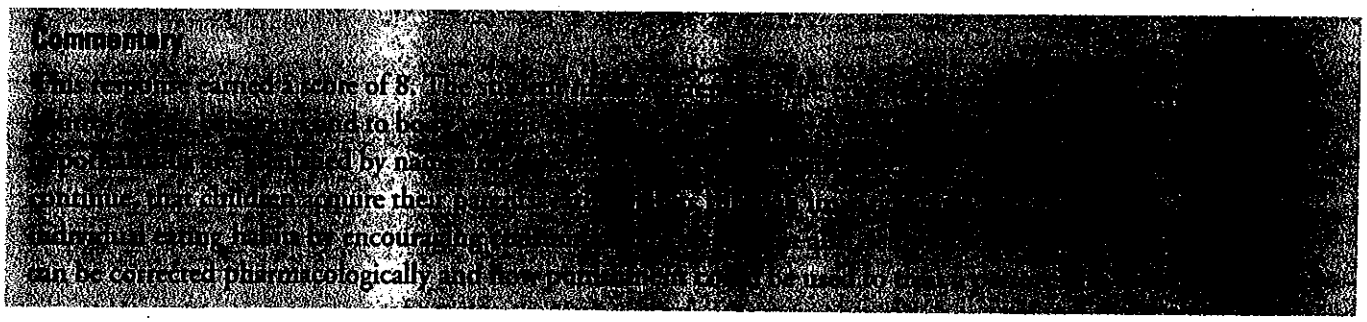
Both biological and learning mechanisms help determine an individual's eating habits and body weight. Biological factors effecting eating habits and body weight are body or brain chemistry, brain structure, and genetics. Body and brain chemistry is the balance of hormones and chemicals in the body and brain. The endocrine system in the brain controls the release of hormones in the body. If there is an improper balance of hormone or chemicals in the body, such as too much or too little glucagon, an individual may eat too much or too little. The brain structure important in controlling hunger and eating habits is the hypothalamus. Lesions on the ventral medial hypothalamus, identified as the satiety center, causes overeating because the brain does not communicate that it is satisfied. Lesions on the lateral hypothamus, identified as the huger center of the brain, cause aphagia, or starvation despite a food source present because the brain does not send the message that it is hungary. Genetics is another biological function that plays a role in determining an individuals eating habits and body weight is genetics Genetics are the study of heredity. Set point, or the amount of body fat an individual

has is genetically predetermined by information on a person's chromosomes.

Learning mechanisms also impact body weight and eating habits of the individual. Reinforcement is the rewarding or punishing of a response associated with operant conditioning. If a certain behavior is rewarded it will continue, and if it is punished the behavior will stop. If overeating or poor eating habits are rewarded, an individual is likely to continue those bad habits and become overweight. If those habits are however discouraged, an individual may be at weight or underweight. Positive reinforcement of good eating habits increases the chance that an individual will have healthy habits and weight. Modeling is how an individual learns by imitation of someone else. If an individual is reared in a home of parents with good eating habits he is likely to copy those habits or immitate poor habits if his parents have poor habits. Cultural factors, or the traditions and practices of ones ethnic, religious or social group also impact body weight and eating habits. Depending on the eating habits encouraged by a cultural group, an individual may be overweight or underweight. Many culture and ethnic groups adhere to certain diets

prescribed to them by their religion.

Biological and learning mechanisms have many implications for weight management. If an individual has improper brain or body chemistry, it is possible that their weight problems could be controlled by the development of a drug that restores proper balance of chemicals or hormones in the brain or body. Reinforcement could be used to control the eating habits associated with weight problems. For example an overweight person could be trained through punishment not to eat too much and/or positive reinforcement could be used to encourage good habits. The opposite could be used for individuals who are underweight.



a person's body weight and eating habits can be attributed by either an internal biological factor - (which can be accounted for by heredity or genetics, or stimulus to certain parts of the brain), or by learning, external factors (which may include: modeling, peer pressure, or reinforcements.) Both can be used to account for a person's weight and habits.

Biological mechanisms deal with the body's internal factors which contribute to weight / habits. The first one is body or brain chemistry. Body / Brain chemistry can be explained by the body's set point and it's metabolic weight. If a person's losing a lot of weight, then the body's set point will adjust the metabolism in a person's body to maintain the normal body weight suited for the person. It will stimulate the brain to send hunger pains and the acid in the stomach will increase; as well as the increase in the contraction of the stomach muscles to alert the person to eat, and to relieve itself of the hunger.

Brain structures are explained by the parts which deals with hunger, which is the hypothalamus. The hypothalamus can either stimulate hunger, or cease hunger by stimulating the ventromedial or the. Those parts in the brains regulate the body's metabolic rate, and controls the body's need to satisfy the hunger. Studies done with lab rats have shown that when certain parts of the brain are stimulated, the rat either begins to eat nonstop, or not to eat at all even though it is clearly hungry. This is because the brain has the ability to control the notification of hunger as well as the body's response to it.

Genetics attribute to eating habits and body weight because some obese cases seems to be linked to genetics. Studies have shown that obese parents are likely to have obese kids, and in turn studies, research has shown a high concordance rate among obese twins. However, this can be a contradictory factor because it can be environmental. What if the children are obese because the parents load the house with junk food and that's all the kids have to eat?

Learning mechanisms also have an effect on eating habits and body weight. Modeling can account for it based on parents to children studies. Obese parents might cause obese children because the children learn to model the parents' unhealthy eating habits and lack of exercise. The children grow to think that it's okay to eat twinkies and ice cream all day. The imitate what their parents do.

Cultural factors are big too in a sense that certain ethnic groups may flow to certain fatty foods and adopt unhealthy eating habits. Asians who feed mostly on rice and noodles, who avoid sweets may be slimmer than, let's say, the average American who is used to sweets for snacks, and also the habit of eating a dessert after a meal.

Reinforcement can attribute to weight/habit as well a depressed person who finds that after a fight, and after a bag of ~~cookies~~, cheese puffs, feels better, may learn to turn to food every time he's depressed. The food ~~eats~~ has a calming effect on him, which is positive reinforcement. ~~Each~~ Each time he's depressed, he turns to food, which in turn might make him feel better.

For a person looking to seek help in weight management, they can turn either to nicotine or learning mechanisms. people who have modeled eating habits can learn to model good eating habits of health and food experts instead of their obese parents, or junk food eating friends. This can help them to control their eating habits as well as help them reach an ideal weight.

Body and brain chemistry can be altered by the body's reaction to it. an athelete's high metabolism which keeps him slim may slow down if he stops exercising. however, a person can speed up his metabolic rate to stay in shape and keep slim simply by exercising more.

Commentary

This response earned a score of 6. The student received a point for recognizing the dual functions of the hypothalamus. However, the discussion of metabolism and body weight set point does not address the issue of body chemistry and no genetically determined effect is provided. The student was awarded points for describing how a depressed individual who eats and feels less depressed will learn to turn to food when depressed, for stating that children imitate parents' unhealthy eating habits, and for providing examples of culturally-determined eating practices. The student also earned points by suggesting that a person could speed up metabolism, and thus reduce weight, by exercising, and by providing an example of modeled eating habits.

Student Response 3 — Fair

Both biological and learning mechanisms play important roles in determining an individual's eating habits and body weight. Genetics is a biological mechanism that affects eating habits and body weight that is predetermined, even before birth. Genetics takes into account genes and genetic material from both the mother and father. The baby's DNA is coded with information concerning eating habits and body weight based on genetic information of family members for generations. Therefore, certain individuals may be predisposed to obesity or high metabolisms. Also genetics plays a role in certain foods that individuals may or may not be able to digest such as lactose. Individuals are able to go for blood testing and have genetic tests done to determine what if any problems they may have concerning their eating habits and body weight. The most effective method for managing genetic mechanisms concerning weight is to simply be aware of them. If an individual knows that high blood pressure runs in their family, it will be easier for him/her to adjust the diet in order to reduce the risk. Also, doctors can prescribe medication to

help with certain problems. Cultural factors are a learning mechanism that also influence eating habits and body weight. Throughout history, society and culture ~~[illegible]~~ mold people to fit an "accepted image. In the past, people who were overweight and ate a lot were placed above thin, emaciated people in the social hierarchy. The overweight people had more money and were, therefore, able to have huge feasts and eat a lot. Thin people were those who could not afford to eat. In today's society, our culture does not view obese people as attractive. The current fad is to be thin. On t.v., all the people are extremely thin because that is what is seen as attractive. Therefore, people try to fit this mold by not eating a lot or simply not eating at all. Our culture is also one that produces a fast paced way of life. People are always moving. Many times they don't have time to eat or eat fast food. As a whole, our culture has produced a lazier generation of people. People today eat unhealthy and many are either too thin or too fat. The way

to manage cultural influence on weight management is to eat right and exercise. Also people need to be happy with who they are and not get so obsessed with what they look like on the outside. Both biological and learning mechanisms can influence eating habits and weight, but both can be controlled simply by being aware they exist.

Commentary

This essay earned a score of 4. The student earned points for reference to the genetic determination of metabolism and for saying that people try to fit a mold of a thin body weight ideal by not eating. The student was also awarded points for discussing dietary and pharmacological interventions related to high blood pressure and for the statement regarding the management of cultural influence on weight.

Student Response 4 — Poor

Genetics - the traits of an individual are used in how a person is already instinctually motivated towards a particular way of feeling about their body weight and the way their body will deal with the level of food they intake

body/brain chemistry - a slow or high metabolism rate will affect one's biological reaction to the amount of food eaten

Learning Mechanisms

Cultural Factors - influences individual by society preference in reference to eating habits/body weight ex: Certain African cultures disire heavier females as oppose to ~~the~~ thinner, which will cause them to appear that way to be more socially acceptable

Reinforcement - negative and positive outcomes of actions in reference to body weight/eating habits will cause an individual to continue a particular habit of eating/sustaining their weight. Ex: if someone has recently been getting heart-attacks, then finds that it has to do with the level of fat intake, then will most likely avoid any ~~[illegible]~~ foods w/ high level to avoid futher attacks

Commentary

This student's essay earned a score of 2. Points were awarded to the student for providing the examples of making a change in diet following a heart attack and individuals seeking a heavier body weight in a culture in which this is the ideal.